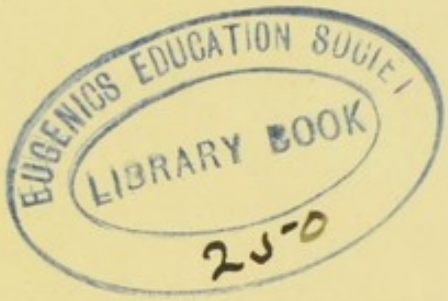
The progress of eugenics / by James A. Field.



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THE PROGRESS OF EUGENICS

SUMMARY

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Unless many signs fail, the study of eugenics has established its claim to recognition among the hopeful

applications of science in social reform. Almost suddenly, within the last few years, the popular apathy which it encountered for half a century has given way to widespread attention and interest, mingled with not a little of that irresponsible enthusiasm which a novel turn of thought provokes. The spirit of eugenic inquiry has spread beyond the country of its origin and prompted investigations undertaken with a scholarly seriousness of purpose which bespeaks for them the critical estimate due to scientific work. At this turning-point in the history of eugenics, the recent death of Sir Francis Galton [1] seems to mark off the period of beginnings, the story of which is so essentially the story of his own life, from the period of wider activity that has now set in. Before the beginnings are forgotten, a review of what has already been accomplished may help to appraise the promise of usefulness which the eugenic movement affords.

I

The idea of a conscious selective improvement of the human breed is not new. Like many another stimulating thought it was clearly uttered long before the time when its fresh expression found the popular mind in the ready and impressionable state which makes possible a far-reaching thought movement. Twenty-three hundred years ago the political dialogues of Plato outlined a policy of controlling marriage selection and parentage for the general good of society; and declared that the statesman who would advance the welfare of his citizens should, like the fancier of

[1] Galton was knighted in 1909, in tardy recognition of his distinguished services to science. In the following pages the title is not prefixed to his name except when the reference is to events subsequent to the date of his knighthood.

birds, or dogs, or horses, take care to breed from the best only.[1] Perhaps it was natural that this idea should have come early to the mind of a man whose experience was with the compact citizen class of a city-state, and whose ideal community was not so large but that each citizen might know how his fellows lived; for it has been remarked that at the present day there is exceptional scrutiny of marrying and giving in marriage among peoples or social classes so isolated, clannish, and inbred that they must necessarily have discovered in their own experience the virtue of good stock and the fate that follows the progeny of degeneracy and constitutional disease. But Plato's project was too fantastic for his time. In following centuries the laws of the Roman Empire, the doctrines of the Church, and the policies of mercantilist states, in so far as they took cognizance of population problems, kept count in terms of soldiers, or souls, or laboring and tax-paying subjects, and for the most part overlooked the inborn differences of men. Even at the beginning of the last century, when the discussion of population problems reached a development quite unprecedented, the quality of the population was still almost ignored in the prevailing concern about questions of mere numbers.

The present eugenics movement may be traced back definitely to the decade beginning with the year 1865, and more generally to the thought-reaction which followed the publication of Darwin's *Origin of Species* in 1859. The new biological doctrines inevitably drew attention to the selective significance of inborn differences, in human beings as in other living forms. Nor was the existence of such differences among men likely to be overlooked by the reactionary

[1] Republic, 459; Laws, 773; and elsewhere.

adherents of a waning aristocratic régime, confronted with the growing prominence of the masses, whose influence was enlarging with their new accession of political privilege and with the more gradual course of industrial change. The stress which Darwin had laid on the cumulative selection of qualities transmitted by heredity put an end to that placid indifference with which the unequal increase of different social classes had been regarded. Even more positively it dispelled the illusions of those who had rejoiced in the relative infertility of the well-to-do, hailing it either as the sign of prudence in at least some places, or as a providential compensation of the hardships of poverty by vouchsafing to the poor an untroubled career of procreation.

The specific starting-point of the eugenics literature is to be recognized in two articles on "Hereditary Talent and Character," written by Francis Galton and published in Macmillan's Magazine for June and August, 1865. Impressed by the plasticity of the physical forms of animals under the breeder's selection, Galton here announced his purpose of showing, more pointedly than had been attempted before, that the mental qualities of men are equally under control.[1] He was encouraged in this, as he himself records,[2] by the influence of *The Origin of Species;* tho the suggestion of the idea had come to him from his own observation of instances of apparent heredity among his contemporaries at Cambridge. Now, he not only repudiated the prevalent view that sons of great men are usually stupid: he went on to show by a mass of biographical evidence how strikingly the frequent occurrence of

[1] These words are substantially those of the opening paragraph of the first article, Macmillan's Magazine, vol. xii, p. 157.

[2] Memories of My Life, London, 1908, p. 288.

able sons of able men indicates that mental qualities, quite as much as physical traits, are subject to the principles of natural inheritance. Doubtless, the son of an eminent man may be favored by superior opportunities. Advantageous associations, as well as inherited capacity, may aid his career. All this Galton was quite willing to admit. But he did not regard established position as the chief reason for the recurrence of talent in distinguished families; and to make his argument more conclusive he avoided the examples of statesmen and generals, who might be thought particularly the creatures of privilege, and sought his facts "in the more open fields of science and literature."[1] His inferences from these facts were eagerly hopeful. "How vastly would the offspring be improved," he exclaims, "supposing distinguished women to be commonly married to distinguished men, generation after generation, . . . according to rules, of which we are now ignorant, but which a study of the subject would be sure to evolve."[2] "If a twentieth part of the cost and pains were spent in measures for the improvement of the human race that is spent on the improvement of the breed of horses and cattle, what a galaxy of genius might we not create."[3] Half jocosely, he proposed the endowment of the marriages of, say, ten pre-eminently marriageable couples, chosen out of the whole nation, after an enlightened examination, on the basis of their qualifications for parenthood. Seriously, he expressed the belief that if the importance of race improvement were recognized, and if the theory of heredity were understood, some way would be found to carry the improvement into effect.[4] The

[1] Macmillan's Magazine, vol. xii, p. 161.
[2] Ibid., p. 164.
[3] Ibid., p. 165.
[4] Ibid., p. 320.

articles were essentially sanguine, — enthusiastic sketches of what might result from the spread of their new idea.

Four years later these preliminary sketches developed into a book, — *Hereditary Genius*, published in 1869. The main thesis, that great ability is hereditary, is here substantially unaltered; supported, now, by abundant genealogical material, which nearly fills the book with pedigrees of judges, statesmen, the English peerage, commanders, literary men, men of science, poets, musicians, painters, divines, the senior classics of Cambridge, — even oarsmen and wrestlers, as examples of the ability of the muscles rather than of the mind. But if the theme is in the main the same, the manner of presentation is notably changed. Galton's characteristic originality of thought is reinforced by his equally characteristic attention to scrupulous precision of method. The quantitative treatment, which he has since called "actuarial," marks the work, opening the way for much of the more recent mathematical analysis of heredity problems. One finds a nice classification of the grades of ability; an ingenious notation; and the especially significant introduction of the law of deviation from an average — suggested, as it appears, by Quetelet's *Lettres sur la théorie des probabilités*, and so applied, in determining the normal frequency of the occurrence of distinguished talent, that the exceptional proportion of eminent men among the sons of eminent fathers mathematically demonstrates exceptional recurrence of ability. The natural consequence of such careful method is a more guarded attitude with reference to putting into practice, for ends of social reform, the principles just restated and reaffirmed. Yet the enthusiasm of the magazine articles may well have

been less eloquently convincing of the possibility of such reform than the book's impressive chapter on Influences that Affect the Natural Ability of Nations. For in this the appeal is not merely to fanciful influences which might be exerted, but to the actual modifications of human quality which stand recorded in history, or work themselves out in the common-place happenings of our own every day. Celibacy of the intellectual classes is condemned anew; the cloisters and nunneries of the Middle Ages and the academic celibacy of present times alike are proven apt means to the elimination of superior intellect. The irreparable debasement of type which followed the course of the Inquisition in Spain — a topic already touched upon by Lyell in his *Principles of Geology* [1] — yields a germane and telling argument. Less dramatic tho perhaps more important is the lesson drawn from a suggestion of four years before, here developed into a classic demonstration, that the social group or nation within which the interval between generations is relatively long will be outnumbered and overcome, through mere inferiority of increase. But it is impossible adequately to summarize a book of which Charles Darwin wrote, "I do not think I ever in all my life read anything more interesting and original." [2] The book is too characteristic for summary — too full of the personality of a great thinker. At best this bare review of its method, its data, and its conclusions will show that Galton's first essays in the subject he was later to call eugenics had greatly expanded. They had in fact grown to the magnitude of a master-work, which has served as a point of departure for his own later writings and for most of the work of others in the field which he had thus marked out.

[1] 10th Ed., 1868, vol. ii, p. 489.

[2] Galton, Memories of My Life, p. 290.

A second pioneer of eugenics had been revealed, during the interval between the appearance of Galton's magazine articles and the publication of *Hereditary Genius*, in the person of William Rathbone Greg, already for years a well-known writer on economic and political subjects. Philanthropic in sympathies and fair in presentation, Greg was chiefly distinguished by an attitude of keen prophetic criticism of the tendencies of his time, and felt a probably undue concern at the increase of democratic and popular influence in public affairs. So it was that he became aware of the menace of adverse selective influences working through the unequal rates of increase of different elements in the population, and wrote, quite independently, and in ignorance of Galton's kindred writings,[1] a brilliant article, "On the Failure of 'Natural Selection' in the Case of Man," which was published in Fraser's Magazine for September, 1868, and, with slight alteration, became the chapter on Non-Survival of the Fittest in a subsequent book, — *Enigmas of Life*.[2] For races and nations, he argued, the principle of the survival of the fittest holds good; but as regards individuals "the indisputable effect of the state of social progress and culture we have reached . . . is to counteract and suspend the operation of that righteous and salutary law. . . ."[3] We keep alive the weak and defective; by our institution of property we subsidize and perpetuate the incompetency which may inherit but could not produce. The rich and the poor, disadvantaged by opposite extreme circumstances of excess and privation, propagate freely. The prudent members of the intermediate class, "most qualified and deserving

[1] Cf. Greg, Enigmas of Life, p. 115.

[2] London, 1872.

[3] Fraser's Magazine, vol. lxxviii, p. 356.

to continue the race, are precisely those who do so in the scantiest measure." [1] In a noteworthy passage Greg outlines a Utopian reversal of prevailing conditions:

> A republic is *conceivable* in which paupers should be forbidden to propagate; in which all candidates for the proud and solemn privilege of continuing an untainted and perfecting race should be subjected to a pass or a competitive examination, and those only be suffered to transmit their names and families to future generations who had a pure, vigorous, and well-developed constitution to transmit. . . . But no nation — in modern times at least — has ever yet approached[2] this ideal; no such wisdom or virtue has ever been found except in isolated individual instances. . . . The face of the leading peoples of the existing world is not even set in this direction — but rather the reverse."[3]

However, Greg was no Utopian. To him this artificial imposition of eugenic conditions seemed obviously impracticable, and its object perhaps not worth the cost. Hope was from within. "We can only trust to the slow influences of enlightenment and moral susceptibility, percolating downwards and in time permeating all ranks. We can only watch and be careful that any other influences we do set in motion shall be such as, when they work at all, may work in the right direction." [4]

[1] Ibid., pp. 360–361.

[2] In Enigmas of Life the passage (pp. 112–113) reads "approached or aimed at."

[3] Fraser's Magazine, vol. lxxviii, pp. 361–362.

[4] Ibid., p. 362. A fusillade of comments followed the publication of Greg's article. On the whole, however, they were unimportant. In the columns of the Spectator two or three contributions turned the discussion aside into the subject of the superior moral elevation which results from such modifications of the selective process as Greg had disapproved. A reviewer in the Quarterly Journal of Science (vol. vi, pp. 152–153; London, January, 1869) dismissed Greg's argument as fallacious on the ground that among civilized men the struggle for existence is between social groups and not between individuals. Much the same answer was given by E. Ray Lankester in his essay On Comparative Longevity in Man and the Lower Animals (London, 1870; pp. 128–129, note). Lawson Tait, in the Dublin Quarterly Journal of Medical Science (vol. xlvii, pp. 102–113; February, 1869), discussed, with more freshness of view, the implication that the work of physicians in curing disease only favored degeneration of the race by prolonging the lives of inferior individuals.

Still a third distinguished personage definitely entered into the discussion of race improvement when Darwin at this time incorporated a passage on Natural Selection as affecting Civilised Nations into his *Descent of Man*, published in 1871 — two years after *Hereditary Genius* and a year before *Enigmas of Life*. His discussion is not highly original: he states [1] that most of his remarks are taken from Greg, Wallace,[2] and Galton. But it is interesting to note how far the author of the principle of natural selection adopts into his own thought the ideas which his thought had provoked. Moreover, in at least one point he appears to differ with Galton: his emphasis on the superior selective importance of slight variations contrasts rather sharply with Galton's primary concern for exceptional ability.[3] He appreciates, too, that agencies of favorable as well as of unfavorable selection are normally in operation. Malefactors are executed or confined. Suicide and violence eliminate some defective or unruly individuals. Profligacy sterilizes itself by disease. Ability favors the support of a family. Yet if these and other factors, recognized or as yet unknown, " do not prevent the reckless, the vicious, and otherwise inferior members of society from increasing at a quicker rate than the better class of men, the nation will retrograde, as has occurred too often in the history of the world."[4]

Two years later Galton was heard from again. In an essay on " Hereditary Improvement," printed

[1] Vol. i, p. 168.

[2] The Origin of Human Races and the Antiquity of Man deduced from the theory of Natural Selection. Anthropological Review, vol. ii, pp. clviii–clxx, 1864.

[3] " In the case of corporeal structures, it is the selection of the slightly better-endowed and the elimination of the slightly less well-endowed individuals, and not the preservation of strongly-marked and rare anomalies, that leads to the advancement of a species. So it will be with the intellectual faculties. . . ." (Vol. i, p. 172.)

[4] Vol. i, p. 177.

in Fraser's Magazine for January, 1873, he maintained "that it is feasible to improve the race of man by a system which shall be perfectly in accordance with the moral sense of the present time." [1] As the foundation of this system he aimed "to build up . . . a sentiment of caste among those who are naturally gifted," and thus, within each existing social group, to draw together in the solidarity of a new and exclusive class consciousness the individuals of greatest merit for what he now tentatively called "viriculture."[2] The achievement of this result must come gradually. However familiar the view had become that the artificial disposition of wealth, the destructive action of town life upon the ablest stock,[3] and the many other unfavorable influences of civilization, were working, through heredity, for human degeneration, Galton did not expect his scheme "to flourish until the popular belief shall have waxed several degrees warmer." [4] But intelligence and a religious sense of duty were alike urgent that a beginning be made.

> I propose as the first step, and the time is nearly ripe for it, that some society should undertake three scientific services: the first, by means of a moderate number of influential local agencies, to institute *continuous* enquiries into the facts of human heredity; the second, to be a centre of information on heredity for breeders of animals and plants; and the third to discuss and classify the facts that were collected.[5]

Primary reliance was thus placed on the increase and diffusion of scientific knowledge with the confident expectation that if once the populace were convinced of the import of heredity, "quite as many social

[1] Fraser's Magazine, N. S., vol. vii, p. 116. [2] Ibid., p. 119.

[3] Cf. Galton's contemporary paper on The Relative Supplies from Town and Country Families to the Population of Future Generations, Journal of the Royal Statistical Society, vol. xxxvi, pp. 19–26, March, 1873.

[4] Fraser's Magazine, N. S., vol. vii, p. 123. [5] Ibid., p. 124.

influences as are necessary will become directed to obtain the desired end." [1]

Thus far the forerunners of eugenics had been Englishmen; but in this same year 1873 an important contribution came from the Continent in the *Histoire des sciences et des savants* [2] by a distinguished Swiss botanist, the younger Alphonse de Candolle. This book, like *Hereditary Genius,* is based on the results of an inquiry into the relationships of eminent men. But de Candolle confined his attention to men of science, and took for his criterion of eminence membership in the leading honorary scientific societies. Cases of the close relationship of these scientists he found strikingly frequent. Yet his conclusions were not altogether in accord with the conclusions of Galton: in fact, at first sight they seem flatly contradictory. To heredity, properly speaking, he attributed little effect except in the case of the mathematical sciences.[3] The preponderant influences appeared to be education and the example and counsel of the distinguished parents.[4] But closer examination of what is meant by "heredity properly speaking" shows that de Candolle was more in harmony with Galton than might have been supposed. Outside of the talent for mathematics he believed, to be sure, that specialized ability is but slightly hereditary. Celebrity, which

[1] Ibid., p. 125. At the close of the article Galton unluckily indulged in a vision of the ultimate results of his project. His picture of a class of the praised and privileged fit, superposed on a population of the rejected, is one which we may rejoice to believe impossible, as well as unjustified by an intelligent interpretation of the forces which he would set at work. If this forecast be ignored, the article agrees in large measure with the best eugenic opinion of the present day.

[2] Histoire des sciences et des savants depuis deux siècles suivie d'autres études sur des sujets scientifiques, en particulier sur la sélection dans l'espèce humaine. Geneva, 1873.

[3] Cf. pp. 107–108. This and subsequent citations refer to the first edition.

[4] P. 101.

implies both particular aptitude and favorable circumstances, is still less controlled by heredity.[1] But generalized capacity, and especially general moral character, are undoubtedly inherited.

> Ce n'est pas, comme on voit, nier l'influence de l'hérédité, c'est la réduire à quelque chose de très-général, compatible avec la liberté de l'individu, et pouvant fléchir ou se modifier suivant toutes les influences subséquentes dont l'action augmente à mesure que l'enfant devient homme.[2]

Plainly de Candolle was less convinced of the inheritance of genius than Galton had been. In fact, he expressly criticised the extreme conclusions which Galton drew.[3] Yet he believed sufficiently in the heredity of human qualities to consider the possibility of improvement by artificial selection and to remark the appearances of degeneration due to selective causes like war, medicine, and unequal increase of rich and poor, which conserve the worse rather than the better types. But altho he thus discussed artificial selection, he conceived it to be for practical purposes non-existent or illusory: marriages of the unfit can hardly be prevented; or, if they are in form prevented, they are likely to give way to illegitimacy. The influence of law or of religion he did not deny, but he classed it with the factors of natural, and not of artificial, selection. Thus, tho he seemed inclined to belittle both the power of heredity and the means by which others hoped it might be made preponderatingly a power for good, his skepticism in each case was less extreme in reality than in appearance.

The reaction of de Candolle's views upon the work of Galton was immediate and unmistakable. A brief article " On the Causes which operate to create Scien-

[1] P. 328. [2] P. 107. [3] Cf., e. g., pp. 243, 281, 380.

tific Men," which Galton contributed to the Fortnightly Review for March 1, 1873,[1] was in effect a review of the *Histoire des sciences et des savants.* "I propose," he wrote on this occasion, "to consider M. de Candolle as having been my ally against his will, notwithstanding all he may have said to the contrary." But Galton was not satisfied merely to contend in a review that de Candolle's work was an argument more telling than its author had known in favor of the inheritance of ability. Characteristically he set about further investigations of his own. Convinced that a more minute study of the antecedents of scientific men would establish the superior importance of heredity as contrasted with education, he prepared a searching questionnaire which he sent to 180 scientists of reputation. The results of his study of more than a hundred replies were published the following year in his book entitled *English Men of Science: their Nature and Nurture.*[2] In form this compilation is reminiscent of the descriptive chapters in *Hereditary Genius:* a careful and circumstantial statement of the relationships of the eminent men under investigation, amplified by a correspondingly minute scrutiny of any influences of experience and training, as well as of ancestral qualities, which might explain the peculiarity of scientific tastes and abilities. The result, in Galton's mind, was further affirmation of the supremacy of nature over nurture[3] — of inheritance over training — so far as the two are separable. "I am confident," he wrote, in the preface, "that one effect of the evidence here collected will be to

[1] N. S., vol. xiii (O. S. xix), pp. 345–351. [2] London, 1874.

[3] "Nature is all that a man brings with himself into the world; nurture is every influence from without that affects him after his birth" (p. 12). The distinction between nature and nurture had already been made in the article of 1873 on Hereditary Improvement, p. 116.

strengthen the utmost claims I ever made for the recognition of the importance of hereditary influence." [1]

One decade had produced all these writings. Clearly, the beginnings of eugenics were congenial to the thought of that period. Yet what was written seems to have been often, as in the cases of Darwin and Greg, an episode, brilliant but without direct continuance, in the course of other work. Apparently demonstration of selective influences reacting on the quality of the population seemed for the time rather to stimulate the new taste for biological speculation than to appeal strongly to persons practically concerned with human degeneracy or with measures of human improvement. "Popular feeling was not then ripe to accept even the elementary truths of hereditary talent and character, upon which the possibility of Race Improvement depends. Still less was it prepared to consider dispassionately any proposals for practical action." [2] Even Galton, whose long span of consistent intellectual activity is the closest link between that early outburst of eugenic ideas and the reawakened eugenic movement of the present, "laid the subject wholly to one side for many years." [3]

The interim between 1874 and 1901 was, however, too prolonged to pass without some new evidence of Galton's interest in eugenics. During this period he published, among other works, *Inquiries into Human Faculty and its Development* (1883), and *Natural Inheritance* (1889). Each has an important bearing on his later writing.

The *Inquiries into Human Faculty* gave eugenics its name.

[1] Pp. vi–vii.

[2] Galton, Memories of My Life, p. 310.

[3] Ibid., p. 310.

. . . We greatly want a brief word to express the science of improving stock, which is by no means confined to questions of judicious mating, but which, especially in the case of man, takes cognisance of all influences that tend in however remote a degree to give to the more suitable races or strains of blood a better chance of prevailing speedily over the less suitable than they otherwise would have had. The word *eugenics* would sufficiently express the idea; it is at least a neater word and a more generalised one than *viriculture*, which I once ventured to use.[1]

Nor was this coining of a term the only conspicuous contribution to eugenics which the book contained. For Galton here reiterated his belief "that human eugenics will become recognised before long as a study of the highest practical importance";[2] he considered, in a passage more interesting for its doubts than for its conclusions, the menace of loss of stamina through close breeding of human strains;[3] and he maintained the possibility of some system of marks for ancestral and personal merit, on the basis of which endowments, portions, or adoption might be made available for persons of meritorious stock.[4] Finally, in the closing words of the book,[5] he foreshadowed the religious sanction for eugenic conduct which has characterized some of his most recent statements of eugenic principles.[6]

Natural Inheritance was essentially a study of the general biological principles of heredity. Altho phenomena of human inheritance were largely utilized in it as material for investigation, its scope was broader than the specific application of the principles it thus derived. It dealt not so much with eugenics as with

[1] Inquiries into Human Faculty, p. 24, note. For the word viriculture, cf. above, p. 11.

[2] Ibid., p. 44.

[3] Ibid., pp. 305–307.

[4] Ibid., p. 327, ff.

[5] Ibid., p. 337.

[6] Cf. especially, Sociological Papers, London, 1904, p. 50, and 1905, pp. 52–53.

the foundations of eugenics. But it has left a lasting mark on subsequent eugenic discussion because of the new lengths to which it carried the mathematical method of analysis in heredity problems — the method which, outlined in *Hereditary Genius* and latterly elaborated by the biometricians, has involved its followers with the followers of Mendel in a spirited and possibly momentous controversy.

A reawakening of interest in eugenics was heralded, on the eve of the present century, by Professor Karl Pearson's vigorous lecture on " National Life from the Standpoint of Science," delivered at Newcastle, November 19, 1900. The message of this lecture was primarily the answer which recent studies of heredity had given to those who concerned themselves with problems of national welfare: the nation is an organism in struggle to survive, and its success in that struggle depends on the strong increase of the best elements of its population. An old truth this may be; but it could still bear repeating at a time when the lecturer was led to say: " I fear our present economic and social conditions are hardly yet ripe " for the movement, urged by Galton, to make " men and women feel the importance of good parentage for the citizens of the future." [1] Moreover, the truth was put bluntly, in an attempt to impress it upon the newly sensitive minds of the British people, aroused at that time, by the course of events, to a questioning of the state of their national power.

The time, indeed, appears to have been unusually favorable to the reception and spread of such teachings. The shock of the reverses in South Africa, by which, throughout England, spirits " were depressed in a manner probably never before experienced by those

[1] National Life from the Standpoint of Science, London, 1901, p. 26.

of our countrymen now living" [1] was "more or less directly" [2] the reason for Professor Pearson's choice of his topic. "I have endeavoured to place before you a few of the problems which, it seems to me, arise from a consideration of some of our recent difficulties in war and in trade." [3] England, in manufacture and commerce as in war, had shown "a want of brains in the right place." [4] But lack of physique as well as lack of brain was causing apprehension, as evidenced later by the appointment (September 2, 1903) of an Inter-Departmental Committee on Physical Deterioration "to make a preliminary enquiry into the allegations concerning the deterioration of certain classes of the population as shown by the large percentage of rejections for physical causes of recruits for the Army and by other evidence, especially the Report of the Royal Commission on Physical Training (Scotland)" — which had been created the year before. Subsequently the Committee was further instructed "to indicate generally the causes of such physical deterioration as does exist in certain classes, . . . and to point out the means by which it can be most effectually diminished." Probably the public had been prepared for notions of degeneracy in some parts of the population by the epoch-making investigations of Charles Booth in London — investigations which were just then culminating, after a duration of more than a decade. Finally, it was not without significance that the school of biologists who stood for quantitative studies by means of the technique of modern mathematical statistics, and among whom Galton was a recognized leader, signalized their growing solidarity and influence by establishing in October, 1901, their

[1] Ibid., p. 9.

[2] Ibid., p. 13.

[3] Ibid., p. 60.

[4] Ibid., p. 30.

journal "Biometrika," which, from the time of its initial number, has published many articles bearing more or less directly upon eugenics.

In this same month of October, 1901, Galton delivered the Huxley Lecture of the Anthropological Institute of Great Britain and Ireland, and returned to the field of eugenics by taking as his subject for the lecture "The Possible Improvement of the Human Breed, under the Existing Conditions of Law and Sentiment." He echoed on this occasion the opinions which had marked his earlier utterances, putting them, however, in the mathematical form of his intervening work. He laid, as usual, special stress on the importance of increasing the productivity of the best stock, rather than repressing the worst; and he outlined, conservatively, possible means to that end, in economic aid, honors, and a sort of religious enthusiasm.[1] Of especial interest was his comment on previous apathy.

> My subject . . . has not hitherto been approached along the ways that recent knowledge has laid open, and it occupies in consequence a less dignified position in scientific estimation than it might. It is smiled at as most desirable in itself and possibly worthy of academic discussion, but absolutely out of the question as a practical problem. My aim in this lecture is to show cause for a different opinion.[2]

To the future he looked with hopefulness balanced by his usual good sense:

> But the first and pressing point is to thoroughly justify any crusade at all in favor of race improvement. More is wanted in the way of unbiased scientific inquiry . . . to make every stepping-stone safe and secure, and to make it certain that the game is really worth the candle. All I dare hope to effect by this lecture is to prove that in seeking for the improvement of the race we aim at what

[1] Nature, vol. lxiv, pp. 663–664, also, Annual Report of the Smithsonian Institution for 1901, p. 534.

[2] Nature, vol. lxiv, p. 659, Rep. Smithson. Inst., 1901, p. 523.

is apparently possible to accomplish, and that we are justified in following every path in a resolute and hopeful spirit that seems to lead toward that end. The magnitude of the inquiry is enormous, but its object is one of the highest man can accomplish. The faculties of future generations will necessarily be distributed according to laws of heredity, whose statistical effects are no longer vague, for they are measured and expressed in formulae.[1]

Such was Galton's reaffirmation of faith in eugenics, after years of work which had borne to it only a "silent reference." [2] Since this Huxley Lecture, partly because of the receptivity of the public mind, partly no doubt through the collaboration of able scientists in allied studies, eugenics has made progress. "Now," wrote Galton, in his autobiography (1908), "I see my way better, and an appreciative audience is at last to be had, though it be small." To this audience he repeatedly addressed himself: the extent of his activity during his last ten years quite precludes any attempt at this point to give each of his publications separate mention. Three papers only, delivered and discussed before the Sociological Society, are chosen for special comment here.

The first of these papers, read May 16, 1904, bore the title: "Eugenics: Its Definition, Scope, and Aims." "Eugenics," as then defined, "is the science which deals with all influences that improve the inborn qualities of a race; also with those that develop them to the utmost advantage." [3] But in what followed, as in most discussions of eugenics, only the improvement of inborn qualities was considered. "The aim of eugenics is to bring as many influences as can be reasonably employed, to cause the useful classes in the community to contribute *more* than their pro-

[1] Nature, vol. lxiv, p. 664. Rep. Smithson. Inst., 1901, p. 538.

[2] Nature, vol. lxiv, p. 659. Rep. Smithson. Inst., 1901, p. 523.

[3] Sociological Papers, 1904, p. 45.

portion to the next generation.[1] To the question thence arising — what influences can be reasonably employed? — came the answer which has taken rank as an authoritative scheme of eugenic activity.[2]

The course of procedure that lies within the functions of a learned and active Society, such as the Sociological may become, would be somewhat as follows: —

1. Dissemination of a knowledge of the laws of heredity so far as they are surely known, and promotion of their farther study. Few seem to be aware how greatly the knowledge of what may be termed the *actuarial* side of heredity has advanced in recent years. . . .

2. Historical inquiry into the rates with which the various classes of society (classified according to civic usefulness) [3] have contributed to the population at various times, in ancient and modern nations. There is strong reason for believing that national rise and decline is closely connected with this influence. It seems to be the tendency of high civilisation to check fertility in the upper classes, through numerous causes, some of which are well known, others are inferred, and others again are wholly obscure. . . .[4]

3. Systematic collection of facts showing the circumstances under which large and thriving families have most frequently originated; in other words, the *conditions* of Eugenics.[5] . . .

4. Influences affecting Marriage [i. e., the influences of social sanction or disapproval, which might be turned to the service of eugenics] . . .

5. Persistence in setting forth the national importance of Eugenics. There are three stages to be passed through. *Firstly* it must be made familiar as an academic question, until its exact importance has been understood and accepted as a fact; *Secondly*

[1] Ibid., p. 47. [2] Ibid., pp. 47–50.

[3] Galton was careful, and for the most part more than ordinarily successful, in maintaining the distinction between superior classes in a eugenic sense and the conventional " upper classes " whose position is a matter of wealth or social pretensions. But the distinction is difficult to keep clear. For example, Galton's assumption that ability is satisfactorily measured by attainment, would in many cases identify ability with the possession of wealth or station.

[4] " The latter class are apparently analogous to those which bar the fertility of most species of wild animals in zöological gardens." Ibid., p. 48.

[5] A thriving family, tentatively defined, " is one in which the children have gained distinctly superior positions to those who were their class-mates in early life. Families may be considered ' large ' that contain not less than three adult male children." Ibid., p. 48.

it must be recognised as a subject whose practical development deserves serious consideration; and *Thirdly* it must be introduced into the national conscience, like a new religion. . . . I see no impossibility in Eugenics becoming a religious dogma among mankind, but its details must first be worked out sedulously in the study. Over-zeal leading to hasty action would do harm. . . . The first and main point is to secure the general intellectual acceptance of Eugenics as a hopeful and most important study. Then let its principles work into the heart of the nation, who will gradually give practical effect to them in ways that we may not wholly foresee.

After nearly a year [1] Galton again addressed the Sociological Society; not, as before, to outline a eugenic system, but rather, in the light of his maturer reflection, to revise the former emphasis and to suggest paths of further work. Under the title of "Studies in National Eugenics," in indicating some of the work to be done, he touched newly on an old project:

In some future time, dependent on circumstances, I look forward to a suitable authority issuing Eugenic certificates to candidates for them. They would imply a more than an [sic] average share of the several qualities of at least goodness of constitution, of physique, and of mental capacity.[2]

But the idea to which he gave most prominence, and which received most attention during the discussion, was that of "Restrictions in Marriage." [3] By all sorts of folk-customs, marriage relations throughout the world are restricted and controlled as social expediency directs. Monogamy, endogamy, exogamy, the Australian marriage-usages, taboo, the prohibited degrees, celibacy — all demonstrate "how powerful are the various combinations of immaterial motives upon marriage selection, how they may all become hallowed by religion, accepted as custom and enforced

[1] February 14, 1905.

[2] Sociological Papers, 1905, p. 17.

[3] Sociological Papers, 1905, pp. 3–13.

by law." [1] "The proverbial 'Mrs. Grundy' has enormous influence in checking the marriages she considers indiscreet." [2] As for the religious sanction, Galton was moved by the discussion to append in the published report a specific note on "Eugenics as a Factor in Religion." [3] Thus the imperiousness of social convention and the moral enthusiasm of religious belief, two motives that are always with us, are given emphatic recognition as potential forces of great promise for eugenic reform.

With these parting instructions and renewed expressions of hopefulness, Galton's active efforts for eugenics may be said to have ended. Almost until his death, which occurred January 17, 1911, he continued to lend the cause the support of his steady interest; and on one or two occasions he consented to speak in public, despite his advanced age of nearly ninety years. But his main work was done. He had been given the rare experience of foreseeing and announcing a new branch of knowledge in advance of his generation, and yet, tho he had made his announcement in middle age, of living to see a subsequent generation overtake his idea and gratefully adopt it. He created eugenics, named it, and formally defined it, as "the study of agencies under social control that may improve or impair the racial qualities of future generations, either physically or mentally.[4]

[1] Ibid., p. 12.

[2] Ibid., p. 51. This remark, from Galton's reply to criticism, was apparently written after the original session.

[3] Ibid., pp. 52–53.

[4] Memories of My Life, p. 321. A later definition will be found in the form of a note to p. 3 of Sociological Papers, 1905: "Eugenics may be defined as the science which deals with those social agencies that influence, mentally or physically, the racial qualities of future generations." This, however, has been less generally used than the definition given in the text.

By his own achievements, by the kindling influence of his enthusiasm, and by the final gift of his main fortune, he has insured that the science he founded shall go on.

II

When once the possibilities of eugenics became apparent to scientific men, other hands took up the task of investigation which Galton, so many years before, had begun, in the attempt to extend our working knowledge of human heredity.

Eugenics is so deeply founded in heredity, historically and logically, that much of the biological literature of heredity may fairly be said to fall within its scope. Relying on the applicability of general biological principles to the particular case of man, students of social problems have borrowed from biology freely, and often, it must be feared, undiscriminatingly, as in their dabblings in the famous controversy over the transmission of acquired characters. But the analogy of guinea pigs or sea-urchins affords at best an unsatisfactory demonstration of human inheritance, and one that has been slow in prevailing against prejudice and misconception, which resent the idea that human lives are in a sense predetermined, or at least limited, by physical endowment of body and brain, much as the lives of other animals are. Fifty years ago, as Galton relates in his memoirs, " most authors agreed that all bodily and some mental qualities were inherited by brutes, but they refused to believe the same of man." [1] Despite the progress of science since then, one still encounters students of social problems who, finding that eugenic principles

[1] Memories of My Life, p. 288.

discredit some favorite scheme of amelioration, or seem to make more hopeless the case of the unfortunate among whom they work, are fain to profess their disbelief in heredity. Here, then, is abundant reason for such special and searching investigations as have come in the last few years.

Of the recent developments in eugenic research, that which most closely links itself with Galton's inquiries is the work of Professor Karl Pearson and his associates. By profession Professor Pearson is a mathematician. Since 1896 he has occupied the chair of Applied Mathematics and Mechanics at University College, London. But an interest in philosophical problems and especially in the theory of evolution turned his attention to the mathematical aspects of various biological phenomena,[1] and, not surprisingly, to the methods of study which Galton's *Natural Inheritance* had proposed. In a series of Mathematical Contributions to the Theory of Evolution he considered and revised the Galtonian Law of Ancestral Heredity, and greatly elaborated the theory of frequency curves and correlation methods, extending their applications to cases where the impossibility of exact quantitative measurement had previously made them inapplicable, and devising safeguards against biased errors in observation. Then, with the new refinements of this " biometric " method at his command, he proceeded to an estimate of the influence of heredity on human traits. Preliminary investigation of the inheritance of certain tangible characters of animals had provided a measure of the degree in which such characters are inherited, expressed in correlation coefficients indicating the resemblance

[1] For early examples of Pearson's work in such subjects, cf. " The Chances of Death and other Studies in Evolution (1897); especially vol. i.

between parent and progeny, or between two individuals of common parentage. In the first of two articles, published in 1903, "On the Laws of Inheritance in Man," [1] Professor Pearson concluded that the inheritance of physical characters in man is more marked than had been supposed: is in fact as strong as in other animals. More impressive still was the conclusion of the second article, dealing with mental and moral qualities, and showing them to be inherited in the same degree as physical traits. To be sure, the subject of this study offered peculiar difficulties; and the method adopted — a study of fraternal resemblance as evidenced by the reports of school teachers — is open to serious question on grounds of bias in the collection of the data. Yet, after allowance for fallacy and error, the result of the inquiry remained too striking to be longer ignored, and still further shifted the burden of proof toward those who denied the transmissibility of mental endowments.

Eugenic investigation took on added definiteness about a year after the publication of these papers, through the generous interest of Francis Galton, who gave to the University of London funds to maintain a fellowship for the promotion of the study of "national eugenics." The writings of Professor Pearson and his followers had heretofore emanated from the Biometric Laboratory, established by Professor Pearson and the late Professor Weldon of Oxford, at University College, London. The authorities of the University of London now provided rooms and facilities for the newly subsidized research in connection with this Biometric Laboratory, and Professor Pearson, at Galton's request, assumed charge of the work. The eugenics fellowship was awarded first to Mr.

[1] Biometrika, vol. ii, pp. 357–462, and vol. iii, pp. 131–190.

Edgar Schuster, and subsequently to Mr. David Heron. Miss Ethel M. Elderton was appointed eugenics scholar. Other persons have participated in the investigations, as computers, collaborators, and advisers. From the laboratory thus organized — The Francis Galton Laboratory for National Eugenics — came an increasing output of interesting and often important studies. Then, last spring, the will of Sir Francis Galton made provision for further expansion. By its terms a residual estate of some £45,000 is left to the University of London " for the establishment and endowment of a professorship — to be known as ' The Galton Professorship of Eugenics,' with a laboratory or office and library attached thereto." The will further makes this statement of what the Galton professor is to do:

1. Collect materials bearing on Eugenics.
2. Discuss such materials and draw conclusions.
3. Form a Central Office to provide information, under appropriate restrictions, to private individuals and to public authorities concerning the laws of inheritance in man, and to urge the conclusions as to social conduct which follow from such laws.
4. Extend the knowledge of Eugenics by all or any of the following means, namely: — (*a*) professorial instruction; (*b*) occasional publications; (*c*) occasional public lectures; (*d*) experimental or observational work which may throw light on eugenic problems.

In accordance with the founder's wish, Professor Pearson has been chosen as the first Galton Professor. Officials of the University of London have issued an appeal for £15,000 to be expended in the construction of a memorial building in which the work of the Galton laboratory may be properly carried on.

The publications of the Eugenics Laboratory are for the most part comprised in two series: the Eugenics Laboratory Memoirs and the Eugenics Laboratory

Lecture Series. A third series, nominally distinct, — the Studies in National Deterioration, published as Drapers' Company Research Memoirs by the Department of Applied Mathematics of University College — presents the results of similar inquiries conducted in the Biometric Laboratory, often by members of the Eugenics Laboratory Staff. Yet another series, Questions of the Day and of the Fray, also published by the Department of Applied Mathematics, has lately been inaugurated. However, a more intelligible statement of what has been accomplished can be made if the publications be for the moment regarded as falling into three groups, namely: (1) compilations of mere material for the study of human inheritance; (2) intensive and technical studies of special eugenic problems; and (3) general statements of the conclusions reached, in simple form for popular information.

The first group consists of those issues of the Eugenics Memoirs which are known collectively as The Treasury of Human Inheritance. These are designed to make available, in standardized, scientific form, without attempt at interpretation or anything controversial, "published and unpublished family pedigrees, illustrating the inheritance in man of mental and physical characters, of disease and of abnormality." The parts thus far issued contain pedigrees of diabetes insipidus, split-foot, polydactylism, brachydactylism, tuberculosis, deaf-mutism, legal ability, angioneurotic oedema, hermaphroditism, insanity, commercial ability, hare-lip, cleft palate, and congenital cataract. The work of compilation appears to have been well done. The evidence thus gathered affords important data, not only for followers of the Galton-Pearson school, but for all who perceive that the progress of eugenics depends on a further knowledge of the facts.

The second group — detailed reports of special studies — comprises most of the Eugenics Memoirs, and the Studies in National Deterioration. Here, perhaps, should also be placed the Questions of the Day and of the Fray, which up to the present have mainly served to carry on a controversy that recent memoirs on the influence of parental alcoholism provoked. Apart from these polemics, fourteen Memoirs and Studies have appeared, dealing with such subjects, among others, as tuberculosis, insanity, the inheritance of the phthisical and insane diatheses, the relative effect of heredity and environment on eyesight, the effect of home conditions on the physique and intelligence of children, and the inheritance of ability.

The third group is coincident with the Eugenics Laboratory Lecture Series. To persons who wish to learn the gist of the results embodied in the more abstruse memoirs, but who are not so critical-minded or so mathematically trained as to grapple with their technicalities, these lectures carry the message of the Laboratory on the paramount import of heredity in human improvement or degeneration. "All human qualities are inherited in a marked and probably equal degree." [1] Sweepingly this is enunciated, as a foundation principle of eugenics; "good and bad physique, the liability to and the immunity from disease, the moral characters and the mental temperament" [2] — all, so far as they are not acquired characters, are included in the claim. Environmental factors, on the contrary, exert an influence of altogether subordinate importance:

[1] Pearson, The Groundwork of Eugenics, p. 20.

[2] Pearson, The Scope and Importance to the State of the Science of National Eugenics, p. 33.

I will not dogmatically assert that environment matters not at all; phases of it may be discovered which produce more effect than any we have yet been able to deal with. But I think it quite safe to say that the influence of environment is not one-fifth that of heredity, and quite possibly not one-tenth of it.[1]

Hence, clearly, attempts at the alleviation or cure of human disabilities should look much more to human nature and much less to the external conditions of the *milieu* than has been usual; and should especially beware of such changes in law or social custom as, by slackening or perverting biological selection, more than undo the direct benefits they have sought to accomplish. Hence, too, that notoriously adverse selection due to the restricted birth-rate fundamentally menaces the racial quality of the future; the more particularly since researches have shown that the neurotic, the insane, the tuberculous, and the criminal are more frequent among the elder-born members of families, and thus constitute an abnormally large proportion of the descendants of persons who have had exceptionally small families.[2] The advance of the science of medicine and the spread of education could make but poor headway against a steady running-out of the stock which they are called on to restore.

The philanthropist looks to hygiene, to education, to general environment, for the preservation of the race. It is the easy path, but it cannot achieve the desired result. These things are needful tools to the efficient, and passable crutches to the halt; but . . . there is no hope of racial purification in any environment which does not mean selection of the germ.[3] . . . Selection of parentage is the sole effective process known to science by which a race can continually progress.[4]

[1] Pearson, Nature and Nurture, p. 27.

[2] Cf. Pearson, The Problem of Practical Eugenics, p. 19.

[3] The Scope and Importance . . . of National Eugenics, p. 39.

[4] The Groundwork of Eugenics, p. 20.

The conclusions announced by the Galton Laboratory have frequently been called in question. Authoritative biological opinion, supported by quite different methods of research, has, to be sure, agreed in assigning much greater weight to heredity than to surrounding conditions. But the findings of Professor Pearson and his collaborators have challenged prevalent opinion so often as to plunge the authors in controversy. In particular, the studies dealing with the effects of parental alcoholism upon children have provoked much hostile comment. Obviously, the assertion that no marked influence on the physique and mentality of the child is produced by alcoholism of the parents discredits much of the best-meant effort now devoted to social betterment, and seems nothing less than high treason to the zealots of the temperance cause. Sentimental protest against such a finding was inevitable. In this instance the temper of the protests had doubtless been exacerbated by irritation at the mathematical treatment which characterizes all the work of the Eugenics Laboratory, and makes the published results nearly or quite unintelligible to persons unfamiliar with the manner of analysis and statement there employed. The criticism which results from prejudice and misunderstanding is, of course, negligible. There remains, however, a valid ground for objection to the assumptions of the actuarial method in itself. To make this more clear it will be necessary to outline a different interpretation of the phenomena of heredity, for purposes of comparison.

According to the Mendelian school, a cardinal principle of heredity is to be recognized in the segregation of alternative characters. The effect of this principle is that the so-called unit characters are, in heredity, indivisible. A given unit character either

appears completely or wholly fails to appear in the bodily make-up of an individual. Thus, for example, either a man is color-blind or he is not, much as a person is either male or female. In so far as inheritance is in this way alternative the intermediate blending of unit characteristics is precluded. The disciple of Mendel therefore conducts his investigations "in such a way that the only possible answer is a direct 'Yes' or a direct 'No.'" [1]

The "actuarial" study of heredity, on the other hand, rests on an altogether different assumption. The Galtonian analysis, and the formulae of Professor Pearson which have developed and emended it, are based on the view that the traits of an individual are not alternative unit characters, but variations of greater or less degree in either direction from an intermediate normal type; and that, if a large number of cases be studied together, the distribution of observed variations about the mean will exemplify the "normal frequency" computed according to the theory of probabilities. Consequently the investigator at the Galton Laboratory does not ask questions to be answered by "yes" or "no." He asks, "to what extent?" and expresses his answer numerically in a coefficient of correlation.

Theoretically, then, if the Mendelian formulation is right, the actuarial method is wrong. Between two alternative unit characters a mean, in the sense of an actual intermediate type, does not exist. In such a case the biometricians' concept of deviations from the normal has no justification in fact. If proof of the incompatibility of the two interpretations were needed, it might be found in the reluctance of Professor Pearson to accept the almost conclusive evidence

[1] W. Bateson, The Methods and Scope of Genetics, p. 20.

adduced by experimenters of the other school. In practice, to be sure, the actuarial procedure may yield results broadly corresponding to the conclusions of the Mendelians; especially where the mass of data is large or the characters studied, being in reality complex groups of undistinguished unit characters, yield collective results which partake of the nature of averages. But correlation methods afford at best a blind and clumsy way of dealing with unit characters. If the unit-character theory continues to gain ascendency, as now seems likely, the authority of the biometricians will decline, and the value of the publications which have thus far issued from the Galton Laboratory will decline with it. Yet even tho the actuarial method be supplanted, it will have served a useful purpose by its example of quantitative work, inadequately conceived but rigorously carried out, at a time when the scientific pretensions of eugenics had still to be established.

Hardly more than a decade has yet elapsed since the rediscovery of Mendel's writings gave a new impulse to the experimental study of heredity. In the course of the search for fresh biological testimony in support of Mendel's views not a little evidence has been derived from inquiries into the transmission of human traits. The general literature of Mendelism has given some attention to unit-character inheritance in man. But thus far the task of systematic eugenic investigation based on Mendelian principles has been largely left to American scientists.

Altho the eugenics movement, under that name, is but a newcomer in America, the course of our earlier thinking and writing on social problems was not without its significant contributions to the subject of race

improvement. The investigations of hereditary criminality carried on by Robert L. Dugdale, in 1874 and 1875, and summarized in his world-famous little book, *The Jukes*, must rank among the most fruitful studies of degeneracy which have yet been made. Later, McCulloch's *Tribe of Ishmael* assembled more evidence of similar purport. Dr. Amos Warner's illuminating chapter on Charity as a Factor in Human Selection, published in his *American Charities* nearly twenty years ago, dates back to a period when, in his own words, there was "almost no literature bearing directly on the subject." Since then the debt of eugenics to scientific philanthropy in the United States has continued to grow. The proceedings of the National Conference of Charities and Correction and of the American Prison Association have contained, from the times of Dugdale and McCulloch and Warner to the present day, interesting evidences of human heredity. Another branch of inquiry has sprung from the suggestion of Dr. Alexander Graham Bell's *Memoir upon the Foundation of a Deaf Variety of the Human Race* (1883), which was followed by Dr. Fay's exhaustive work on *Marriages of the Deaf in America*, and supported by Dr. Bell's endowment of the Volta Bureau, at Washington, for the collection of information concerning deaf-mutes. From biological beginnings, revealed in a chapter or two of *Footnotes to Evolution*, Dr. David Starr Jordan developed the eugenic message of *The Blood of the Nation* and *The Human Harvest*. Latterly, Dr. Woods, in his *Mental and Moral Heredity in Royalty*, has produced a valuable book after the manner of Galton's earlier studies. On the other side, Professor Ward's *Applied Sociology*, weaving its author's social philosophy and the conclusions of Alfred Odin's *Genèse des grands hommes*

into a remarkable protest against the physical determinism of heredity as expressed in Galton's work, glowingly affirms the power of society to develop latent genius by the fostering social environment of education. Such are a few conspicuous examples of pioneer eugenic thought in this country. With them should be mentioned the little-known project of Mr. Loring Moody, of Boston, who, in 1881 or 1882, proposed to establish an Institute of Heredity, and, by means of a school with lectures and a library, to diffuse "knowledge on the subject of improving our race by the laws of physiology." [1] This plan, however, was frustrated by Mr. Moody's death, and the organized dissemination of eugenic instruction which it contemplated long remained unrealized.

A new phase of eugenics in this country began in 1906 with the appointment of the Committee on Eugenics of the American Breeders' Association. The latter society had been formed in 1903, by scientific breeders of animals and plants, to promote the study of heredity in its bearings upon their methods. When, with the purpose of organizing this study, the Association determined to appoint a comprehensive system of committees, it recognized the applications of heredity to human well-being by naming a Committee on Eugenics. Some persons, to be sure, felt at that time that a wholly independent organization would be more appropriate. The American Breeders' Association consequently authorized its eugenics committee to sever itself from the parent society if that course should be deemed best. But the opinion prevailed that the serious study of human heredity would be promoted by close alliance with investigators in

[1] The details of this project have been communicated to the Eugenics Record Office.

related fields; and that in so far as sentimental adherents might be frightened away by distaste for so frank an analogy between the breeding of men and the breeding of cattle, the effect on the ultimate usefulness of the committee would be more salutary than otherwise. Accordingly, for three or four years the Committee on Eugenics continued to exist, with a growing membership and a slowly widening sphere of activity. Then, in July, 1910, it was raised to the rank of Eugenic Section, coördinate with the Plant Section and Animal Section of the original constitution, and permitted to form committees of its own. The committees at present organized are concerned with the heredity, respectively, of the feeble-minded, of insanity, of epilepsy, of criminality, and of deaf-mutism. Each committee has its chairman and its secretary, experts in the special subject. The chairman of the Eugenics Section as a whole is David Starr Jordan; and the secretary is Dr. Charles B. Davenport, director of the Department of Experimental Evolution of the Carnegie Institution, at Cold Spring Harbor, Long Island, where the work of the section virtually centered until the Eugenics Record Office was founded in order more definitely to centralize and supplement the activities of the several committees.

The Eugenics Record Office was opened in October, 1910, in a building of its own at Cold Spring Harbor, on land adjoining the experiment station of the Carnegie Institution. This proximity permits of close touch between the investigators of human inheritance and the biological experimenters, and makes it possible for Dr. Davenport to direct the work of both. But the Record Office is none the less distinct, as it is maintained by special funds from contributors interested in the cause, and manned by its own staff,

under the immediate charge of its Superintendent, Mr. H. H. Laughlin.

The main work of the Record Office is the collection of family pedigrees revealing the presence of some trait or defect the inheritance of which is to be studied. Inasmuch as these pedigrees are analyzed not in masses and by averages, but individually according to Mendelian principles of descent, it is important that each should, if practicable, comprise the history of a wide family connection through several generations, with all possible detail that might bear on the subject of inquiry. The data for such compilations are secured partly by correspondence, in the form of standardized "Records of Family Traits," and partly through the field workers of the Record Office or of coöperating hospitals, asylums, and other institutions. Once secured, the material is recorded in genealogical charts, with the aid of conventional symbols showing at a glance not only degrees of relationship, but also legitimacy; sex; cause of death; bad habits, diseases, or defects such as alcoholism, habitual wandering, criminality, sexual immorality, tuberculosis, syphilis, epilepsy, feeble-mindedness, insanity, paralysis, neurotic condition, deafness, blindness; or, if the information establishes it, normality. The completed records are kept on file in a fireproof room at Cold Spring Harbor, and made particularly accessible by an elaborate system of catalogue references to families, localities, characteristics, and the like. As evidence accumulates it is published in the form of Eugenic Record Office Bulletins. In addition to these, a series of Memoirs is contemplated.

Thus far the researches of the Record Office have centered about the heredity of mental disease and deficiency. Two of the Bulletins already published

deal respectively with feeble-mindedness and insanity. A forthcoming number is devoted to epilepsy, and material is collecting for other related reports which are to follow. The field workers have delved in the family histories of certain isolated, inbred, and degenerate communities in New York and New England. The "Ishmaelites," whom McCulloch first made known, are being scrutinized again in the light of newer methods. The "Jukes", too, are to be further investigated. Nor is the striking lesson which these inquiries already foreshadow all that is gained. During the summer months the staff of the Record Office directs the training of a class in eugenic field work, conducting its students through isolated districts where the feeble-minded are found living in hovels, and more particularly through establishments for the insane and feeble-minded. There the students, confronted with patients and histories of patients, see with their own eyes a telling demonstration of the cost, in misery and care, caused by the breeding of tainted stocks. More than that, the students and their methods are themselves seen by the persons in charge of hospitals and asylums, who are thus often convinced of the value, for their own purposes and for the public good, of such a tracing back of the ailments which they treat. The directors of the Eugenics Record Office have met with hearty coöperation at such institutions; and it is most gratifying to hear that more than one state has taken steps to support in some measure the scientific economy of an investigation which may lead to a momentous reduction of the burden of caring for the mentally unsound.

III

Substantial advance has thus been made in the knowledge of those biological fundaments on which the hope of eugenic improvement is built. With the advance has proceeded the persistent setting forth of the social importance of eugenics for which Galton spoke.

No doubt the influence of the Eugenics Laboratory Lecture Series, of the more recent publications of the Eugenics Record Office, and of the independent writings of competent students of heredity and social problems, has been considerable. Unfortunately, however, the very conservatism of scientists, wary of announcing results which have yet to be demonstrated, has probably left the larger number of readers to receive the prophecy of eugenics indirectly, through unauthoritative writings of advocates whom Galton would hardly have wished as allies. A cause less sound at the core might well have been hurt by so much misstatement and sentimentalism, compromised by being used to serve the turn of hobby-riding radicals, or discredited by the adherence of the facile partisans of free-love, always willing to hatch their own project by the warmth of any nearby attempt at reform. In the face of these difficulties, Eugenics seems to have progressed far toward both a wider and a more discriminating reception.

One ally which Galton did approve, and which has been active on behalf of eugenics, is The Eugenics Education Society, founded in London in 1907. In the space of little more than three years this association has attained a membership of over 500, exclusive of the enrolment in branches established at Glasgow,

Liverpool, Haslemere, and Dunedin, New Zealand. Since the spring of 1909 it has successfully maintained a quarterly journal, The Eugenics Review. In its beginnings the society was a somewhat heterogeneous body, whose members, save for a common interest in eugenics, came to it with different view points and unequal qualifications for helpful effort. Its task was indubitably difficult. Mindful always of the lack of proven knowledge, and always respecting the injunction that "the pace must not be hurried," [1] the society was none the less enthusiastically to raise its voice in the wilderness, winning converts for a future cause. At first the outcome was dubious. But the young organization quickly proceeded to find itself; was both wise and fortunate in securing the aid of Sir Francis Galton as honorary president; and, with his advice and through the energy and good sense of its executive officers, seems to have worked out a structure and a plan of action which promise a useful future. Latterly, under the supervision of the Research Advisory Committee, original inquiries have been made into the histories of pauper families and into the biological factor in infant mortality. The society has no official connection with the Galton Laboratory. Tho it follows attentively the results of the Laboratory researches, and is guided by them in choosing and directing its activities, it is equally attentive to the contributions of the Mendelian school. There is possibly danger of inconsistency in a policy shaped by such eclecticism; but so long as the Mendelians and the biometricians themselves show as little inclination as now to compromise, one may trust them to keep their own doctrines pure, and may expect more benefit than harm to follow a well-meant

[1] Galton, Probability, the Foundation of Eugenics, in Essays in Eugenics, p. 99.

effort to join forces in the ranks of social workers wherever there is common ground.

The Eugenics Education Society is no longer a local influence only. During the past summer it organized a Eugenic Section in the Congress of National Health, at Dublin, the public authorities having this year for the first time thus recognized the place of eugenics in the campaign for health. Further, the Society has arranged to hold in London, in July, 1912, the First International Congress on Eugenics. Already the support and coöperation of well-known scientists have been secured in England, Germany, France, and the United States. The establishment of a section for race hygiene at the Dresden Internationale Hygiene-Ausstellung of the past summer; the meeting there of the Internationale Gesellschaft für Rassenhygiene — a union of constituent societies in Germany, Sweden, and Switzerland; and the still more recent gathering at Paris of the fourth International Genetic Conference may be taken to prove a growing interest in eugenics and related subjects, and to augur well for the success of the eugenic congress next year.

The practical application of eugenic principles lies mostly in the future, when there shall be more certain knowledge of the true principles to apply. But in the meantime, as knowledge grows, opportunity is given at least for partial and temporary remedial measures, to check the apparent degenerative tendencies that contemporary economic and social conditions create. Moreover, if an ultimate policy of race improvement is to be elaborated, there must be a working hypothesis of the task to be accomplished. For both these reasons eugenists must look toward the problem of practical eugenic procedure, and consider in particular, tho

it be only provisionally, the distinction between positive and negative, or, in the happier terms of Mr. Crackanthorpe, constructive and restrictive, eugenics.[1] Is the eugenic ideal more attainable by promoting the increase of superior stock and thus cultivating high ability, or by checking the propagation of the inferior, and so eliminating the congenitally unfit ?

Unquestionably Galton conceived and elaborated the program of eugenics in the positive, constructive sense. The opening paragraph of *Hereditary Genius* announces the thesis that " it would be quite practicable to produce a highly-gifted race of men by judicious marriages during several consecutive generations." It was, in fact, genius which had commanded Galton's attention from the time of his first inquiries into *Hereditary Talent and Character*. Latterly his broadening view became more aware of the need for restrictive eugenic agencies, as well; [2] but still the selective breeding of excellences remained the primary object in view. His idea of a caste based upon superior hereditary capacities; his reiterated allusions to competitive examinations for eugenic merit, and to endowments and marriage portions for the eminently meritorious; these and other recurring signs unmistakably showed the main current of his thought. And so, in his outline of *Eugenics: Its Definition, Scope and Aims*, he declared " The aim of Eugenics is to bring as many influences as can be reasonably employed, to cause the useful classes in the community to contribute *more* than their proportion to the next generation." [3] With yet greater definiteness he had already written: " the possibility of improving the race of a nation depends

[1] Cf. Eugenics Education Society, Second Annual Report, pp. 7–8.

[2] Cf. the last paragraph of the introduction to the 1892 edition of Hereditary Genius.

[3] Sociological Papers, 1904, p. 47.

on the power of increasing the productivity of the best stock. This is far more important than that of repressing the productivity of the worst." [1] Altogether, one may without great inaccuracy apply to the aggregate of Galton's eugenic writings his own remark in the *Inquiries into Human Faculty*: "I have not spoken of the repression of the [inferior stock], believing that it would ensue indirectly as a matter of course." [2]

It has been maintained that positive and negative eugenics are one and the same process, viewed from opposite sides: that the relative increase of the better is the relative decrease of the worse. However true this may be as an abstraction, it is not necessarily so significant in its application to actual conditions. We cannot divide all of mankind sharply into sheep and goats and deal with either half in its entirety. Practically, eugenics is likely always to have to concentrate its efforts on the comparatively few who are manifestly good or notoriously bad — working at the fringes of the population and leaving untouched a great residuum of mediocrity. And since these two conspicuous fringes may be of very different extent, very unequally distinguishable from the general stuff of society, and very unlike in their amenability to control, it is by no means clear that the reformer can work, at his pleasure, upon either the top or the bottom with the same result.

For several reasons restrictive eugenics offers at present the greater promise of a beneficial outcome. A number of human defects, easily recognized and apparently nearly or quite unit characters in inheri-

[1] The Possible Improvement of the Human Breed . . . Reprinted in Essays in Eugenics, p. 24.

[2] Inquiries into Human Faculty, p. 336.

tance, are by common assent heavy burdens to the individual whom they afflict and the community in which he lives. Insanity, deaf-mutism, serious congenital defects of vision, epilepsy, haemophilia, would be grave disabilities in any state of society which we may reasonably foresee. The feeble-minded, already anachronisms of evolution, must presumably become more and more tragic laggards as intellectual development goes on. On the other hand, the positive virtues of the future are not so obvious and simple. Energy, versatility, a nervous organization sensitive but not fragile, strong parental instinct, altruism — such have been suggested as eugenic ideals; but they, like the still more general desiderata of ability and health, are not so much unit characters as complexes and coördinations of qualities which our present understanding of heredity would find baffling and intractable.[1] Galton himself was not unaware of these perplexities;[2] tho he made but a lame attempt to evade them by contending that "conflicting ideals . . . alternative characters . . . are wanted to give fulness and interest to life."[3] His conclusion that "the aim of Eugenics is to represent each class or sect by its best specimens; that done, to leave them to work out their common civilisation in their own way,"[4] scatters the difficulty, but does not meet it. Indeed, it adds to the previous confusion an impossible suggestion of a society compounded of as many sub-races as there are recognizable virtues.

Aside from these obstacles, the realization of constructive or positive eugenics awaits the coming

[1] Cf. the trenchant chapter on The Problem of the Birth Supply in H. G. Wells's Mankind in the Making.

[2] Cf. Eugenics: Its Definition, Scope and Aims, Sociological Papers, 1904, p. 45.

[3] Ibid., p. 46.

[4] Ibid., p. 46.

of the eugenic conscience. Legislation, as we know it, can decree "Thou shalt not" and execute its decrees against unfit parenthood by segregation of defectives; it is nearly powerless to enforce "Thou shalt." Even conscience could more easily master the primeval impulse that actuates human increase than create parental instinct where it did not already exist. Voluntary celibacy induced by a sense of eugenic duty is undeniably an unfortunate and perverse expedient. It almost surely aggravates the infertility of the thinking classes, and further weakens the spirit of nothing venture, nothing have, which national vigor and natural selection require. Nevertheless, where it is practised it does accomplish the extinction of defective stock. Therein it is more effectual than the opposite manifestation of duty is likely to be. For the vital human qualities will not be found to thrive in the atmosphere of a family life which is merely conscientious.

Whatever the cogency of this reasoning, the preponderance of eugenic writers advocate the adoption of restrictive rather than constructive eugenics, believing that thus indirectly a result really more constructive will be achieved. In fact, before the eugenics movement had begun to make headway, many a worker among the criminal, degenerate, or diseased, had observed the nemesis that follows them from one generation to another, and had become persuaded that for the good of society and the rescue of unborn posterity such blighted lines of descent should be cut off. A concrete result of this conviction is to be seen in the restrictive marriage laws of a number of the American states, and several foreign countries, designed to prevent the marriage of persons afflicted with epilepsy, feeble-mindedness, or other specified

defects or diseases. A motley literature, for the most part marked by advocacy of radical remedies, has been another result. An extreme example of such writings is W. D. McKim's *Heredity and Human Progress*, the author of which, satisfied " that heredity is the fundamental cause of human wretchedness," and without faith in the adequacy of systematic segregation to root out the evils he describes, argues for Nature's method of elimination by means of " a *gentle, painless death*," from carbonic acid gas asphyxiation, " restricting the plan, however, to the *very* weak and the *very* vicious," — idiots, imbeciles, most epileptics, insane or incorrigible criminals, and others who for one grave cause or another are now supported or detained by the State.[1] Saner and altogether more impressive is the argument of Dr. Rentoul's earnest book, *Race Culture; or, Race Suicide?* in favor of surgical sterilization of degenerates and defectives. The operation of vasectomy, which Dr. Rentoul first proposed as a eugenic measure some years ago, and to which the name of " Rentoul's operation " is not infrequently applied, has already assumed importance as a practical measure. Sterilization, by this or some other method, has been legalized as a preventive of the procreation of the imbecile, insane, and criminal in Indiana (1907), California (1909), Connecticut (1909), and New Jersey (1911). The results of this striking experiment are thus far regarded as favorable, tho experience has been too brief and too limited to warrant a final judgment.

[1] Op. cit., p. 188.

IV

A quickening of popular interest has called forth, in the last two years, a succession of books designed to acquaint the public with the scope and purposes of eugenics.

Of these books the first, most pretentious, and least successful is Dr. Caleb W. Saleeby's *Parenthood and Race Culture* [1] put forward as "a first attempt to survey and define the whole field of eugenics." [2] Dr. Saleeby reveals himself as an enthusiast, with a touch of the prophet's fine frenzy, but without the measure of scientific judgment which we have come to demand even of prophets when they venture into such difficult and vital subjects. His central theme — an assumption, supported by an aphorism taken from Ruskin — is the supreme importance of life and the renewal of life, which importance he sees reflected upon eugenics and its thought for the life of posterity. This view-point gives a semblance of unity to the book, and certainly saves it from becoming a mere adaptation of biological commonplaces. But the unity is that of an *idée fixe*, rather than of a systematic presentation. "I claim for eugenics that it is the final and only judge of all proposals and principles, however labelled, new or old, orthodox or heterodox." [3] Rendering such blinking allegiance to an emotional half-truth, Dr. Saleeby cannot be judicial. He plays fast and loose with his premises; bases his rules for conduct now on custom, now on utility, now on mysticism, as the course of the argument suggests; and shows himself unpleasantly intolerant of those who,

[1] Parenthood and Race Culture. An Outline of Eugenics. London (Cassell & Co.), and New York (Moffat, Yard & Co.), 1909.

[2] Preface, p. vii.

[3] Preface, p. ix.

not having taken the precaution to beg the question at the outset, encounter difficulties in the eugenic program. The total impression is of sentiment rather than of science. And yet one would not deny to Dr. Saleeby the virtues of his defects. After all, eugenics rightfully has its need for emotional appeal, provided ordinary reasonableness is not violated. In protesting against the mere germ-plasm ideal of motherhood and in magnifying the eugenic rôle of woman the book provides a just corrective against the too impersonal drift of much that is more critically written. The chapters on The Racial Poisons, strongly influenced by the author's experience and outlook as a physician, are interesting and in many respects serviceable; despite the fact that at the very point where the discussion becomes most concrete and documentary, in treating of the racial degeneracy due to alcohol, it unluckily runs upon controversial ground and finds itself opposed by the conclusions of the Pearson school. Throughout are excellences of detail. There is a sane conservatism, however it may have been arrived at, in the author's disapproval of chloroform and other violent expedients; in his coolness toward fantastic projects of constructive eugenic selection; in his reliance for the present upon obvious restrictive measures. A certain vivid earnestness is in his style, at its best. Heard as separate lectures, not a few passages would well serve to awaken in the auditor a sympathetic desire to learn more. Dr. Saleeby has many of the qualifications of a successful popularizer. But his attempt at a systematic treatise failed.

Very different in plan and in temper is Mr. and Mrs. Whetham's book, *The Family and the Nation.*[1]

[1] The Family and the Nation. A Study in Natural Inheritance and Social Responsibility. By William Cecil Dampier Whetham and Catherine Durning Whetham his Wife. London and New York: Longmans, Green & Co., 1909.

Here is no attempt at a systematic formulation of eugenics. Instead, we find first a review of the principles of heredity and variation applicable to man, and then a simple study of the adversely selective birth-rate of present-day England, and its menace to racial quality. The treatment of heredity is spread thin, suggesting a fear of leaving some hopeful theory unmentioned rather than a convinced sense of proportion and emphasis. The Mendelian view of the subject on the whole prevails. Numerous charted pedigrees showing the inheritance of defects and abilities constitute an excellent feature and offer an easy transition to the topic of the rise and decline of families. A browsing research in the peerage and elsewhere yields family records which certainly suggest the recurrence of inherited aptitudes, tho they do not amount to demonstration. With this evidence of the sustained high records of distinguished stocks, and with the assumption "that success in life indicates ability, and that ability is a desirable possession for a race," [1] the authors proceed to discuss the selective effects of a differential birth-rate. Their analysis of some of the influences which work, through the possibility of voluntary restriction of births, to bring about the virtual extinction of successful families, is more than ordinarily well done, and is sympathetic and wise enough to recognize motives in themselves worthy, however misplaced, among the factors of so lamentable a result. Such are "the feeling of overwhelming responsibility towards possible children" [2] and the accompanying blindness to the larger responsibility toward all posterity; the excessive pursuit of travel and out-of-door sports; the desire to better the position of woman rather by transplanting her

[1] P. 134.

[2] Op. cit., p. 181.

interests from a home life that has not always been held in just estimation, than by raising her race-motherhood to the high place of honor which eugenics demands for it. To correct these mistaken ideals, and others less defensible, is plainly the central purpose of the book. Elsewhere are proposals to "segregate the worst types of the feeble-minded, the habitual criminal, and the hopeless pauper," [1] or, entering on the more hazardous ground of positive eugenics, to try, perhaps, tax exemptions in favor of income spent in the education of children, or endowments of young women who seem possessed of exceptional qualifications for parenthood. But these are slight and incidental; the lesson which the authors would convey is the broad lesson that so long as the size of families declines in those lines of descent which have been marked by manifest ability, so long the nation will decline through loss in power of achievement. This is no new idea, to be sure; nor is it very critically stated. The whole book may be described, partly in commendation and partly in censure, as amateur. Mr. Whetham is a scholar and writer of distinction in other fields of science, and both he and his wife are parents who give thought to their honorable calling. But in biology and the social sciences, so far as appears, they speak with no special authority. Judged as an original scientific contribution their book would be nearly negligible. One is moved to judge it otherwise on account of its general good sense, its pleasant, readable style, and its lack of pretension to be more than it is. In addition to these virtues, it has the appeal characteristic of writings by those who are sincerely and earnestly interested in their work, and therefore interesting.

[1] Ibid., p. 212.

From the pen of an American biologist comes the book next to be considered, *The Social Direction of Human Evolution; An Outline of the Science of Eugenics*,[1] by Professor William E. Kellicott, of Goucher College. Aiming at neither originality nor exhaustiveness, Professor Kellicott has expanded the substance of three lectures on eugenics to the compass of a small volume in which he attempts briefly and suggestively to set forth the present status of the science. Through the social generalities of his introductory section on the sources and aims of eugenics he makes his way passably well, but without distinction, to the biological topics with which he is more at home. Even there, his discussion of variation is likely to seem dreary and unmeaning to the layman who has yet to learn its full significance for the question at issue. But once the subject of heredity is reached the treatment becomes decidedly interesting. The Mendelian formulation is made clear with the aid of admirable diagrams. The "actuarial methods" of the biometric school, and the concepts of continuous variation, normal frequency, regression, and correlation, which they involve, are outlined with no little skill. As between these two interpretations the author declares for the Mendelian as "obviously of much the greater importance on account of its more exact, more particular character," and because "its greater definiteness gives it a value in the treatment of eugenics that statistical statements must inherently lack."[2] Yet he is of opinion that the two schools are not irreconcilably at odds: that rather the biometricians are but dealing in the mass with the same phenomena which the Mendelians study in individual

[1] New York and London: D. Appleton & Co., 1911.

[2] Op. cit., p. 81.

detail. Hence, until the complex human traits which now baffle Mendelian analysis are differentiated into component unit characters, the actuarial method may be profitably used to reveal a statistical preponderance of hereditary influences the separate operation of which is not yet known. Unfortunately, evidence on human heredity is still largely of the statistical sort. But with reference to many abilities and defects the testimony of pedigree charts is already impressively clear. Numerous diagrams of this kind illustrate the final section of the book, on Human Heredity and the Eugenic Program. It is doubtful if any other statement of the case for eugenics could make such eloquent appeal as these simple diagrams in which the mark of deaf-mutism or feeble-mindedness or some other grave and persistent infirmity blackens the whole page of a family's history, generation after generation. Professor Kellicott does not confine himself to demonstrations of defect. He borrows from the Whethams' book their graphic charted records of able families. His program of social reform, however, is preponderantly restrictive: "In concrete eugenic practice it seems probable that most can be accomplished for the present by striving to limit the multiplication of the undesirable, dependent, or dangerous elements of the social group. There can be less uncertainty here."[1] This note of conservatism is for the most part sustained in the more specific proposals for reforms and in the reassertion of our great need for further knowledge of heredity. The conservatism, it must be admitted, is the conservatism of the biologist: insistence on the necessity of exact biological knowledge, coupled with much of the unthinking assurance that, once such knowledge is attained, only comparatively

[1] Ibid., p. 232.

trivial perplexities remain to obscure the way of the social reformer. Professor Kellicott, entering on so wide a subject, has not wholly escaped the provincialism of a specialist. Notwithstanding, he has produced a book better adapted to serve as a general, readable, introduction to the contemporary literature of eugenics than any other which has thus far appeared.

Most recent of the works here to be considered is Dr. Charles B. Davenport's forthcoming *Race Improvement through Eugenics.*[1] Dr. Davenport's connection with the Eugenics Record Office, as well as the direct, tangible, quality of his earlier booklet on *Eugenics: The Science of Human Improvement by Better Breeding* [2] gave promise that his further writings would add a distinctive element to existing eugenic literature. That expectation is now in a measure realized. Because of the unique character of certain parts of the book, a special discussion of its method may be permitted.

By way of preliminary it must be said that the book does not afford a good, comprehensive exposition of eugenics as the study has ordinarily been interpreted. It is abrupt, rather scattering, and by no means always carefully worked out. Moreover, it is partisan, in the sense that its author is so committed to the current Mendelian interpretation of heredity and to the method of pedigree study, as indicating what the principles of heredity are, that the characteristic view-point of the Galtonian school is almost ignored. The partisan quality, however, shown in the extreme to which the author has thus gone in holding to one dominant group of biological assumptions and conclusions (for the two are hard to distinguish), is precisely what gives to his work its chief significance.

[1] The discussion of this book is based on a reading of advance sheets kindly furnished by the publishers, Messrs. Henry Holt & Co., New York.

[2] New York: Henry Holt & Co., 1910.

The heart of the volume, as well as substantially half its bulk, is in the long chapter on The Inheritance of Family Traits. Earlier chapters have emphasized the primary concern of the eugenist for more intelligent marriage selection, and announced definite adherence to the unit-character theory, which regards persons, with reference to heredity, not as individuals, but as transmitters of a set of specific traits, borne on in latent potentiality as "determiners" in the germ substance, through long ancestry, and revealed, indivisibly, but alternatively, according to some partly discovered law, in the characteristics of posterity. Obviously next in order is a catalogue of unit characters and their manifestations and behavior, so far as known. This catalogue, in surprising comprehensiveness, the chapter now under review affords. Hereditary characteristics are here discussed under no fewer than forty-one heads, with numerous sub-headings. The list comprises, among others, such traits as color of eyes, hair, and skin; stature; weight; special ability in music, drawing and painting, literary composition, calculating, memorizing; general bodily energy; general bodily strength; general mental ability; epilepsy; insanity; pauperism; criminality; various forms of nervous disease; defects of speech, sight, and hearing; cancer; tuberculosis; pneumonia; skeletal deformities; and so on. Supplementing the text and greatly increasing its value, charts and diagrams have been utilized to an extent unprecedented in popular treatises on eugenics. The cogency of this array of evidence is, however, by no means uniform. On the heredity of eye-color, Huntington's chorea, or color-blindness, to take a few examples, the cumulative and mutually confirmatory results of independent researches have established highly definite conclusions.

Concerning deaf-mutism, feeble-mindedness, and certain mental diseases, the fact of heredity is vividly demonstrated, and the manner of inheritance is sufficiently revealed to give ground for adoption of practical measures of reform. But when deductions relative to body-weight are drawn from the records of four to six families, with an aggregate of fifteen, or twenty-three, or twenty-seven children; or when particular mental abilities, only vaguely definable, are investigated on the basis of reports upon family traits by persons whose good intentions do not make them experts and may unconsciously make them biased observers — then the result is of very much less scientific credibility. Dr. Davenport is by no means blind to the uneven value of his material; but his own estimate of its validity is not always clear. A large proportion of the generalizations in this chapter which are introduced by such phrases as "there is no doubt," or "the conclusion seems justified," are in fact far from convincing. The critical reader feels that inferences from weak evidence have been ventured with tacit reliance on the analogy of apparently similar instances in cases where the evidence is strong. Doubtless such procedure is permissible if it is not carried too far. So many human qualities have been shown to be hereditary that heredity may not unreasonably be presumed to influence all human qualities. The unit-character concept and the hypothesis of the presence or absence of specific determiners have so satisfactorily explained many phenomena of inheritance that it is but reasonable to believe they will be found applicable to many others. Nevertheless, where the applicability is not yet proven and where the unit characters themselves are not adequately disentangled — as in such an apparently complex

instance as that of "general mental ability" — one may well be chary of recognizing a "Mendelian ratio" "within the error of the method." If Dr. Davenport had classified his evidence differently, and had gathered together his dubious conclusions in a section by themselves instead of scattering them topically among the less debatable results, his compilation would be more satisfactory to exacting readers, and would have set before the lay public a clearer example of the scientific discrimination which eugenics so much needs. As it is, he may expect the opposition of those who are not Mendelians and a somewhat qualified assent from the more conservative of those who are. But to persons willing to base eugenic conduct on more or less conjectural data he has given much reason for very serious thought and no little reason for definite action.

The later chapters, tho they are on the whole of secondary importance, contain several novel and interesting suggestions directly traceable to the Mendelian view-point from which the book is written. Thus the principle of the dominance or recessiveness of characteristics lends new significance to migration and to the opposite condition of settled life in isolated localities; since "negative traits multiply most in long established and stable communities where much inbreeding occurs, while positive traits are increased by emigration, as a fire is spread by the wind that scatters firebrands." The heavy incidence of deaf-mutism or feeble-mindedness in out-of-the-way settlements results from the intermarriage of relatives in whose germ-plasm the particular defect is latent. It is, indeed, with reference to recessive defects that consanguineous marriages in general are dangerous. But altho the latency of defects in a stock apparently

normal is the source of insidious danger when the family records are unknown, this same phenomenon of recessivity offers one means of eliminating defects from the population without resort to sterilization or segregation or other radical measures. For so long as either parent comes of a stock free from a given recessive defect, the presence of that defect in the other parent will be without adverse influence on the children or on any descendants so long as no intermarriages with similarly defective stock take place. In this way rational eugenic marriages might keep indefinitely in abeyance many grave disabilities. Such control, however, becomes possible only when scientific family pedigrees are regularly available. It is unattainable if human traits are reckoned in masses and averages, without regard for the special evidence of each individual's own ancestry.

Outside of England and the United States one meets with comparatively few contributions to the literature of eugenics in the strict sense — the eugenics which takes its name and its view-point from Francis Galton. Undoubtedly the eugenics movement has been influenced by such products of European thought as the Italian studies in congenital genius and criminality, or the demography and public hygiene of more than one continental country, to say nothing of Mendel or Weismann. It is true, too, that in the years of Galton's earlier writings more than one important book of kindred purpose came out of France. Ribot's *L'Hérédité psychologique* (1873), Jacoby's *Etudes sur la sélection dans ses rapports avec l'hérédité chez l'homme* (1881), and Guyau's *Education et hérédité* (1889), deserve mention among the older studies into the heredity of human characteristics. Yet on the whole

the French, with their own special population problem to concern them, have been busied with questions of numbers and have done little to advance the selective improvement of quality. Germany, with its *Rassenbiologie,* has contributed much more. And tho the writings of this school are too extensive and too much a special literature by themselves for any detailed analysis here, their importance as a supplement and corrective to the narrowness of much that is written on eugenics demands for them at least passing notice.

The publication, in 1889, of Georg Hansen's *Die drei Bevölkerungsstufen* gave currency to a stimulating theory of national exhaustion and decline resulting from the constant indraft of population from the country to the towns, where, as was now alleged, the vigor of the country-born raised them for a time into active, dominant efficiency in city life, from which they were doomed to fall, exhausted by a generation or two amid city conditions, toward extinction in the lowest levels of the proletariat. Almost simultaneously with the appearance of Hansen's work, Otto Ammon of Karlsruhe, pursuing anthropological researches in the recruiting statistics of Baden, was led by the evidence of measurements of the cephalic index to conclude that the long-headed Teutonic race responds in a marked degree to the attraction of the towns, where, of course, it is subject to whatever deleterious conditions attach to urban life. In this cityward drift of the Teuton, who has so long been the active and energetic factor in history, it was not difficult to read a prophecy of racial decline, and to find justification for a crude social and political philosophy claiming the support of the principles of natural selection. Such an interpretation, in suggestive but uncritical form, was offered in Ammon's later work,

Die Gesellschaftsordnung und ihre natürlichen Grundlagen, first published in 1895. From France, almost simultaneously, came Lapouge's *Les sélections sociales;* a brilliant but eccentric book, tracing the vicissitudes of races subjected to the selective influences of war, political and economic life, religion, law; and considering the possibilities of systematic selection with the purpose of racial improvement. A journal, the Politisch-Anthropologische Revue, established in 1902, testified to the growing interest in the new application of anthropology to social problems. But this interest still lacked the counterpoise of a due scientific discrimination: the writings of laymen who ventured on the difficult ground of race biology commanded attention because of the appeal of their subject, while the works of competent investigators, scattered through various technical journals, failed of a proper effect. With the express purpose of remedying this situation the excellent Archiv für Rassen- und Gesellschafts-Biologie was founded in 1904, as a means of bringing together whatever studies by biologists, physicians, anthropologists, sociologists, economists, jurists, historians, or others, might converge on the common, central topic of the life and development of the race. The Archiv continues as it began, under the editorship of Dr. Alfred Ploetz, president of the Deutsche Gesellschaft für Rassenhygiene.

Another important series of publications which has been supposed in some measure to owe its existence to the influence of Ammon's social theories is the group of prize essays issued with the collective title *Natur und Staat.* Under the distinguished auspices of Professors Haeckel, Conrad, and Fraas, prizes to the extent of 30,000 marks were offered, in 1900, for essays on the enigmatical theme: " Was lernen wir

aus den Principien der Descendenztheorie in Beziehung auf die innerpolitische Entwickelung und Gesetzgebung der Staaten ?" The vagueness of the topic was made even more puzzling by specifications subjoined to it, requiring of competitors an exposition of the principles of heredity and historical examples of the adaptive modifications of political and social tradition — a mixture, that is to say, of biological fact with sociological analogy. The announcement of the prize laid the greater stress on the sociological interpretation; the principles which actually determined the award apparently reversed this emphasis. As might have been expected, the contributions were various in scope and too often disjointed in treatment. However, two at least of the essays which the competition called forth — Schallmayer's *Vererbung und Auslese im Lebenslauf der Völker*, which was awarded the first prize, and Woltmann's *Politische Anthropologie*, which failed of an award and was published independently — made substantial contribution to the biology of society. Apart from whatever of originality these books may contain, they are interesting as systematic attempts to interpret the reversed selection which results from the civilized mode of living, and to reconcile proposals of artificial and corrective selection with the imperative laws of the natural process which has been only in part evaded and thrust aside. Not the least service which the prize essays in general have performed was to call forth the scholarly critique by Professor Tönnies, " Zur naturwissenschaftlichen Gesellschaftslehre," [1] which, with Schallmayer's spirited reply,[2] illuminates many of the inherent difficulties of a eugenic program, by whatever name it may be called.

[1] Jahrbuch für Gesetzgebung, especially 29 Jahrgang, pp. 27–101.

[2] Ibid., 30 Jahrgang, pp. 421–469.

V

A review of what has been accomplished in the field of eugenics during the last decade clearly reveals that most of the solid writing and of the really scientific and useful work has come from biologists. The competent student of economic and social questions has rendered comparatively little aid. Perhaps until now his abstention from the discussion has been wise. Experts were not needed to repeat the memorable suggestion that a civilization which should acquire control over the qualities of the human breed might thereby control human welfare also. That suggestion, vital in itself, has been readily enough kept alive by the conviction of the inexpert that anything is the better for tinkering; and in the meantime the biologists, called upon to answer in terms of the laws of heredity whether such modification of mankind is possible, have been coming more and more to the conviction that whoever can determine marriage selection in the present will determine, within large limits, the physique and intellect of the future, and will become in a new sense the maker of history. But in proportion as the biologist foreshadows the physical possibilities of heredity and selection, the want grows for wisdom with which to utilize them. What sort of history, then, is best worth the making? What sort of history does it lie within our power to bring to pass? Is this momentous marriage selection, from motives half rational, half mystical, in their veneration of the continuance of life, to prevail in spite of popular ignorance and passion? Or, leaving this question of practicability for experience to decide, is it after all sensible to burden the present generation with concern for generations of the future whose needs we can

hardly foretell; and, in subservience to the science of the day, to repudiate instinct older than all human experience by "falling in love intelligently"? [1] We have need of a social philosophy to tell us how far eugenic reforms are reasonable and worth while.

Even in its broadly biological aspects eugenics is involved in the long-standing demarcation dispute over the respective jurisdictions of man's artificial control and the unmodified course of natural evolution. Less than twenty years ago one of the greatest of biologists, writing on this very subject, declared in no uncertain terms his disbelief in the practice of artificial selection, as a means of human betterment, by reformers who would eliminate the weak and unfortunate, and "on whose matrimonial undertakings the principles of the stud have the chief influence." [2] Knowledge has grown, no doubt, since *Evolution and Ethics* was written, and new discoveries have gone far to discredit Huxley's belittlement of the potency of human selective agencies. The details of the biological mechanism by which changes are effected have become far better known. More dubious is the question how much advance has been made toward a wise guidance of such agencies. For Huxley, there was "no hope that mere human beings will ever possess enough intelligence to select the fittest." [3] Possibly the social consciousness of a people is an abler guide than he recognized. Perhaps, altho the fittest state of society is beyond our perception, we may achieve by means of eugenic selection a succession of experimental changes which seem to us for the better. But still the order of nature decrees that eugenic experi-

[1] Cf. Davenport, Eugenics, ch. 1, §3.

[2] Huxley, Evolution and Ethics, Prolegomena, p. 37.

[3] Ibid., p. 34.

ments made in haste are repented at leisure. The eugenist who modifies the race type in the present predetermines for better or worse the mental and physical endowment of distant posterity. In the final analysis, eugenics, like other attempts at lasting reform, must move with the stream of processes which preceded human intervention and limit it still.

Yet in such a stream a steered course may well be better than mere drifting. Traits that have shown themselves the constant sources of weakness and suffering for generations, or through successive culture epochs, seem authoritatively marked by the protest of nature as proper for extirpation. When, on the other hand, physical organs or mental capacities of fundamental importance in modern life show signs of failing under the burden of the civilization which has been built like a superstructure upon them, the continuance of the present manner of civilization demands a strengthening of these, its organic foundations. So much may be hazarded, in generalization, touching the cases in which eugenic initiative is compatible with natural selection. But the eugenist in action must always proceed with the caution of one who reckons with the inscrutable.

If the task of eugenics were to establish a new aristocracy of inborn ability, the prospect of success would be less obscure. The historical institutions of ruling castes and hereditary nobilities have shown that the special capacity which in one generation after another can seize and retain for itself special opportunity has long been competent to raise the family line of its possessors above their less favored fellow-men. Now modern biology, from a new standpoint and with new significance, reasserts the privilege of birth. It is not surprising, therefore, that writers from Galton

down, arguing for the eugenic selection which shall perpetuate and intensify exceptional ability, have virtually proposed an aristocratic social order of a novel kind. But every preferment of the abler members of a community is tantamount to a degradation of the less gifted. To create an exclusive caste founded on eugenic superiority would be to intensify the unhappiness of such persons as are already inferior. The principle of the survival of the fittest normally involves wholesale sacrifice of the unfit; but such unmitigated rigor of selection does not commend itself as a humane method of social amelioration. Nor is the temper of the times favorable to aristocracies of any sort. It calls for a general betterment of the whole mass of mankind.

Can eugenics bring to pass this universal improvement? Probably many a devoted follower of the cause has assumed that if its benefits can be realized by any they might be extended to all. Such was the vision of Greg:

> Every damaged or inferior temperament might be eliminated, and every special and superior one be selected and enthroned, till the human race, both in its manhood and its womanhood, became one glorious fellowship of saints, sages and athletes; till we were all Blondins, all Shakespeares, Pericles', Socrates', Columbuses, and Fénelons.[1]

But to hold such opinions is to ignore the relativity of success, and to miss the very meaning of eminence. In a world of Blondins a tight-rope walker would command no profit or applause. A world of great teachers would lack for pupils to be taught. The unknown continent which every one had found could hardly immortalize its multitudinous discoverers. Nor could any one master-dramatist make mankind his

[1] Enigmas of Life, p. 112.

audience so long as all clamored with equal right for hearing. Unfortunately, too often we overlook, in our projects of reform, the comparative character of individual attainments and individual happiness. We bemoan the rarity of greatness, forgetting how largely the exceptional individuals whom we call great are great because they are exceptional. If, then, we are to elevate a whole community, we must work by a standard free from the element of invidiousness; for no social reform can achieve a general improvement of men's positions relative to the positions of their fellow-men.[1]

Apparently then, eugenic selection is concerned not with the conditions of eminence but with the conditions of efficiency. It must work for the internal efficiency which we roughly call sanity and a good constitution, and for the external efficiency which enables an individual, regardless of the comparative efficiency of other individuals, to make steady progress in forcing his non-human surroundings into conformity with his needs. Doubtless the distinctions here implied are indefinite. For instance, the personal advantage of health and strength is diminished if equal physical vigor becomes the common possession of all. Unusual prowess in exploiting external physical resources — that is to say, exceptional economic success — has notoriously been among the most potent causes of inequality. Yet in a civilization which already ministers, by palliatives, to ill health; and in which the distributed burden of caring for the incompetent almost certainly drags more heavily on those who are stronger than would the potential competition which

[1] It is interesting to note that this fact, so often ignored in contemporary discussions of eugenics, was emphasized by Mr. Lawson Tait more than forty years ago, with reference to the passage from Greg cited in the text. Cf. Dublin Quarterly Journal of Medical Science, xlvii, p. 112.

incompetency now holds in check — in such a civilization, the promise of gain to come from the eradication of feeble-mindedness, or insanity, or the proneness to consumption, would outweigh any new stress of circumstances which it might involve. And with this alleviation of the miseries from within might come augmented economic efficiency, not of the few, but of the many: a general and continuous advance in those characteristics of body and mind which make for man's larger control of heretofore reluctant gifts of nature.

If this sketching of the possibilities is even roughly true it calls again for the verdict of the biologist. Already he has shown reason to believe that factors of health and disease act in heredity with a simplicity and directness which permit of intelligent control. It is now to be seen whether the constructive economic virtues may similarly be resolved in terms of tractable unit characters, and how far they may be reënforced with social solidarity capable of binding over to the service of the common welfare the industrial aggressiveness which might otherwise only aggravate the antagonisms of economic life. The future of eugenics thus depends still on the progress of sober, discriminating research in heredity. The time for applied eugenics, except in the restriction of obvious and serious disabilities, has hardly come.

But it is by no means only the biologist whose judgment is required. Again and again, in the light of biological discoveries a more adequate answer must be sought to that crucial question the significance of which the biologists have mostly failed to comprehend: granting that by rational marriage selection certain re-combinations of human characteristics can be effected at will, what eugenic policy

promises the maximum increase of human welfare? To aid in answering that question the economist is needed. For health and strength and intellect work out the good or ill fortunes of their possessors according to the ways of economic civilization, and not by process of brute struggle for existence. Eugenics is not mere biology. The problems of eugenics are problems of human society.

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